

Patent claims

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1. Optical wave-guide (1) comprising a plastic optical fiber (2, 3) including a fiber core (2) and a fiber cladding (3) having a single- or multilayer structure, and at least one protective sheathing (4) enclosing the plastic optical fiber (2, 3), the fiber cladding (3) or at least its outer layer being made of a fluorine-containing plastic and the protective sheathing (4) being made of polyamide in which the protective sheathing (4) is made of polyamides or copolyamides or mixtures thereof having a melting point of less than 220 °C and is self-adhesively applied to the fiber cladding (3), the maximum concentration of the carboxyl terminal groups of the polyamide being 15 µeq/g and the concentration of the amino terminal groups being in the range of 50 µeq/g to 300 µeq/g.
 2. Optical wave-guide as claimed in Claim 1 in which the polyamides or copolyamides or mixtures thereof have a melting point of less than 210 °C and particularly preferably less than 200 °C.
 3. Optical wave-guide as claimed in Claim 1 or 2 in which the polyamides are selected from the group consisting of PA 11, PA 12, PA 610, PA 612, PA 1212 or the copolyamides PA 6/12, PA 6/9/6, PA 6/9/12, PA 610/6, PA 610/11, PA 610/12, PA 612/6, PA 612/11, PA 612/12 or mixtures thereof, PA 12 being particularly preferred.
 4. Optical wave-guide as claimed in any one of Claims 1 to 3 in which the maximum concentration of the carboxyl terminal groups of the polyamide is 15 µeq/g and the concentration of the amino terminal groups is in the range of 90 µeq/g to 250 µeq/g.
 5. Optical wave-guide as claimed in Claims 1 to 4 in which the concentration of the amino terminal groups is adjusted by the addition of mono- or difunctional amines or by the excess of a diamine component making up the polyamide.
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6. Optical wave-guide as claimed in Claims 1 to 5 in which the polyamide includes at least one additive from the group consisting of UV stabilizer, heat stabilizer, crystallization promoter, softener, flameproofing agent, external lubricant and organic filler.
7. Optical wave-guide as claimed in Claims 1 to 6 in which the fiber cladding (3) is made of vinylidene fluoride, tetrafluoroethylene, hexafluoropropene, methacrylic acid-tetrafluoropropylester, methacrylic acid-pentafluoropropylester, methacrylic acid-trifluoroethylester, methacrylic acid-heptadecafluorodecylester as well as mixtures or copolymerisates of the above substances, alternatively also of acrylic acid- or acrylate-modified polymers, copolymers or polymer mixtures.
8. Optical wave-guide as claimed in Claims 1 to 7 in which the fiber core (2) is made of polymethyl methacrylate (PMMA).
9. Optical wave-guide as claimed in Claims 1 to 8 in which the outer diameter of the plastic optical fiber (2, 3) is in the range of 75 - 3000 μm .
10. Optical wave-guide as claimed in Claims 1 to 9 in which the outer diameter of the fiber cladding (3) is $1000 \pm 60 \mu\text{m}$ or $750 \pm 45 \mu\text{m}$ or $500 \pm 30 \mu\text{m}$.
11. Optical wave-guide as claimed in Claims 1 to 10 in which the diameter of the fiber core (2) is smaller than the corresponding outer diameter of the fiber cladding (3) by approx. 10 to 20 μm .
12. Optical wave-guide as claimed in any one of the preceding Claims 1 to 11 in which the outer diameter of the optical wave-guide (1) is in the range of 0.15 mm to 5.0 mm.